

3799_1001_000 Declaration of Dr_Schmidt (2)
US 10/506,646
Your Ref. FC02002US
HBSR Ref. 3799.1001-000
SGD/AA/cmb

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Oemer Uensal, Joachim Kiefer and Gunter Christ
Application No.: 10/506,646 Group: 1796
371(c) Date: December 08, 2004 Examiner: Henry S. Hu
Confirmation No: 4984
For: MIXTURE COMPRISING PHOSPHONIC ACID CONTAINING
VINYL, POLYMER ELECTROLYTE MEMBRANES
COMPRISING POLYVINYLPHOSPHONIC ACID AND THE
USE THEREOF IN FUEL CELLS

CERTIFICATE OF MAILING OR TRANSMISSION
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4-30-09 Carol M. Bowerman
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DECLARATION OF DR. THOMAS J. SCHMIDT UNDER 37 C.F.R. §1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Dr. Thomas J. Schmidt, am a citizen of the Federal Republic of Germany and
reside Mörfelden-Walldorf, Germany, hereby declare and state as follows:

1. I am a fully trained chemist, having studied and graduated in chemistry at University of Ulm, Germany and prepared my PhD. thesis at University of Ulm in Fuel Cell Research. I held positions at Ernest Orlando Lawrence Berkeley

National Laboratory in Berkeley, CA and at Paul-Scherrer-Institute, Switzerland, both in applied fuel cell research and development.

I am well acquainted with technical English.

2. I, Dr. Thomas J. Schmidt state that I have more than 5 years scientific practice in applied fuel cell membrane and membrane electrode assembly work and that I consider myself qualified by my education, knowledge and many years of experience to make this Declaration. I currently hold the position of R&D Director at BASF Fuel Cell GmbH (previously named PEMEAS GmbH).

I have read and understood the instant applications and the pending claims.

3. Experiments carried out under my supervision show that a proton conducting membrane prepared by the method described below, wherein the polyazole polymer film was doped with 7% by weight of polyvinyl-containing phosphonic acid, possesses conductivity at 160 °C that is less than 0.00001 S/cm (10^{-5} S/cm).
4. In the experiments carried out under my supervision, proton-conducting electrolyte membranes were prepared according to the following method:
 - (a) a polyazole polymer film was expanded with an aqueous solution of a 10% by weight of vinyl phosphonic acid (VPA) at room temperature for 24 hours; and
 - (b) the vinyl phosphonic acid present in the liquid of step (a) was polymerized.

After step (a) has been performed, a doping ratio was measured based on weight variation of the polymer film before and after expansion. It was found that, after expansion, the polymer film included about 9% by weight of VPA and the proton-conducting electrolyte membrane, after

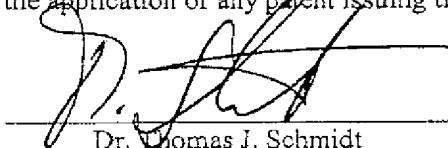
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polymerization in step (b), contained about 7% by weight of polyvinyl-containing phosphonic acid.

Next, the conductivity of the membrane that resulted after step (b) was measured at 160 °C. It was found that the conductivity was less than 10^{-5} S/cm.

5. I further declare that all statements herein of my own knowledge are true and that all statements made on information in belief are believed to be true; and further that the statements are made with the knowledge that willful false statements of the like so made are punishable by fine or imprisonment or both Under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereof.



Dr. Thomas J. Schmidt

27-04-09
Date